

**DETECTION AND DISCRIMINATION OF
INSTABILITIES IN PROCESS CONTROL LOOPS**

ABSTRACT

- A method and apparatus determines the presence of and source of instabilities, such as limit cycles, within a process control loop while the process control loop operates on-line within a process environment. The method and apparatus measures one or more signals within a process control loop when the process control loop is connected on-line within a process control environment, stores the measured signal as signal data and then performs one or more statistical analyses on the stored signal data to determine whether instabilities exist and, if so, whether the source of an instability is within a servo loop or outside of a servo loop and is due to friction, external forces or mechanical anomalies.